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Some Anomalous Forms of Saxifraga Virginiensis.

Along the steep rocky bank near the east shore of upper Manhattan Island there is a place, about on a line with One-hundred-and-sixtieth street, where *Saxifraga Virginiensis*, Michx., still grows abundantly. On April 17th of the current year, when the plants were just coming into full flower, I noticed among them one with apetalous blossoms, the conspicuous yellow anthers making a noticeable contrast with the pure white petals of the ordinary form. I collected the plant, but, unfortunately, lost it before a critical examination hȧd been made. A week later I visited the place again, and found fully a dozen of these peculiar apetalous *Saxifragæ* growing within a few feet of each other and only a few feet from the site of the one first observed.

Upon close investigation these plants proved to be unquestionable *S. Virginiensis.* In size, however, they were decidedly below the average of the normal form, the slender scapes being only two to four inches high, and there was no trace of petals or anything of a petaloid appearance discoverable in any of them. In most of the plants the flowers were few, small and singularly imperfect as regarded the stamens. These were a mere jumble, some of them only withered stumps of filaments, others sessile anthers greenish in color and curiously like ovaries in shape, and not one in twenty was normal in form or appeared capable of producing pollen. The pistils, though small, seemed the same as usual, but in general aspect the flowers were melancholy abortions, and if these specimens had been the only ones secured I should have concluded that the plants were merely the natural imperfect growth from imperfect seeds, and should have given them no further consideration.

Happily, however, two out of the dozen or more collected were very different from their weaker brethren. In these two, which had more stocky scapes and a generally healthier look, I was surprised to find that nature had been creditably successful in establishing a new and definite order of things. In other words, the variation from the normal structure of the flower consisted in the regular conversion of the petals into stamens—that is to say, a single stamen stood opposite each calyx-lobe, and an anteposed pair opposite each calyx-sinus. This made the total number fifteen, the extra outer five occupying precisely the positions of the five petals. The exact order here indicated prevailed in fully half the flowers on the two plants. In the others some part of the outer whorl was altogether missing, but there were always at least one or two of the anteposed pairs. In one case two such pairs were crowded in opposite a calyx-sinus, making seventeen perfect stamens in the one blossom. The pistils in these two plants appeared entirely normal. The anthers were rather larger than in the ordinary flowers, and, when ripe, had slightly reddish tips. Even in the bud they were fully exposed, the calyx-lobes not being large enough to close over them, a peculiarity which gave the plant a little resemblance to the common mignonnette. I cannot say that this new form of *Saxifraga Virginiensis* is any prettier than the old-fashioned one, or even as pretty, but certainly in the fresh state the naked compact star-shaped clusters of anthers presented a very odd and interesting appearance, stoutly usurping, as they did, the places of the ousted petals, and ranging in color from red-tipped yellow in the full-grown flowers to translucent white in the smaller buds.

So far as I can learn, the form of *Saxifraga Virginiensis* here described is entirely unmentioned in botanical records. Other freaks of the species, however, are duly recorded. William Oakes, in Hovey's Magazine of Horticulture and Botany for May, 1847, established, on a plant found at Topsfield, Mass., in 1842, the "variety *chlorantha*, petals pale green instead of snow-white, . . . and margins and backs sprinkled with short hairs. . . ." There is no hint of more than one plant of this form having been observed by him, and the case, as the name frankly intimates, was plainly one of simple chloranthy, a form of teratology by no means infrequent.

Another freak is recorded by Mr. Meehan, who reported in the American Naturalist for August, 1872, the finding of a double-flowered specimen at Woburn, Mass. In the BULLETIN for October of that year Mr. Leggett quotes this, and adds that he had seen a similar specimen.

If we regard the two plants which I have described as merely teratologic, we shall still find them of unusual interest, for they exemplify perfectly the rare staminody of petals, the exact reverse of the usual change. So rare is this metamorphosis of petals to stamens that Masters, in his Vegetable Teratology, records only two or three perfect examples of it. In the common shepherd's purse, *Capsella Bursa-pastoris*, he says such a change " has been observed," but he quotes no authority. The one positive case, which seems to rest on his own observation, he states in these words: " There is in cultivation a form of *Saxifraga granulata*, wherein the petals are replaced by stamens, so that there are fifteen stamens."

S. granulata is a common European species, with large and handsome white flowers, and has been a garden plant for many years, and it is pretty certain that the variation occurred in some florist's establishment, and, being an oddity, was maintained in cultivation for a while by division, quite independent of seeds. In the present case, however, the new form appears in the wild state, and the plant must produce good seeds "after its kind" in order to be perpetuated and diffused. To my mind the evidence is considerable that it is already doing this.*

Now, why has this change occurred in two species of the self-same genus, separated as to station by over a thousand leagues of land and water? Is this identity of variation in *S. granulata* and *S. Virginiensis* a mere coincidence? Or have we here a striking case of atavism? Is this variation the recurrence, in the descendants, of the peculiar and long obsolete structure of their common ancestor? Was the progenitor of the hundred and sixty or more distinct *Saxifragæ* of to-day a plant with apetalous and fifteen-stamened flowers? We shall never know with certainty, but two of its descendants testify strongly in the affirmative. I would even go a step farther, and hazard the conjecture that the original of the Saxifrages was diœcious, or at least polygamous. In the two perfect plants I have described the stamens were remarkably vigorous and well developed. In the ten or more others the stamens, as I have said, were singularly imperfect, and numbers of them were curiously ovary-like in appearance. Is it possible that these plants were blindly struggling to reproduce a primitive pistillate form? A certain confirmation of this idea is found in the fact that in *S. crassifolia* an abnormal increase in the number of pistils has been repeatedly observed.

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* In case the new form should perchance prove permanent, I propose for it the name: *Saxifraga Virginiensis*, var. PENTADECANDRA.—E. E. S.

The few conjectures in which I have indulged are confessedly mere speculation, and perhaps quite erroneous. However this may be, all botanists, I am sure, will agree that it will be well worth while to examine with special attention any apetalous *Saxifragæ* that may hereafter be detected.

E. E. STERNS.

The Lateral Lines in the Leaf of Erythroxylon Coca.

Commenting on the remarks of Prof. Schrenk, elsewhere indexed, the writer would present the following observations on these lines, made during an extended study of the living plant:

The leaf is longitudinally folded in the bud, the two lateral lines supporting the folds below, and the midrib and free borders of the leaf forming the upper edge of the bud. It does not necessarily follow that the lines are caused by the folding. The office of strengthening-tissues at such a point is obvious. It has long been accepted by importers that the prominence of these lines, and their proximity to the midrib, are characteristic of the quality of the leaf as a drug. As to the first part of this rule, it is borne out by the statements of the natives who chew the leaves. They select in preference a leaf exhibiting strongly pronounced lines; but I could not learn that their proximity to the midrib was at all considered by these people. Conditions of growth produce the greatest variation in the appearance of the leaf, particularly as to these lines, and a corresponding degree of difference in the amount of alkaloids contained. As soon as a plant escapes from cultivation the leaves deteriorate, and the lines grow fainter until they disappear altogether. If the plant escape to a "pajinal," as the bare sunny hillsides are called, the leaves become thick and pubescent; while if it escape to the deep forest they vary in the opposite direction, becoming large, pale, thin and flabby; but in either case the lines lose their prominence. I have extreme specimens of both these forms, with scarcely a trace of any lines, and in which no cocaine can be detected by the nerves of the tongue. H. H. RUSBY.